Distributed Database Management for an Obstetrical Service: The BabyTracker Experience

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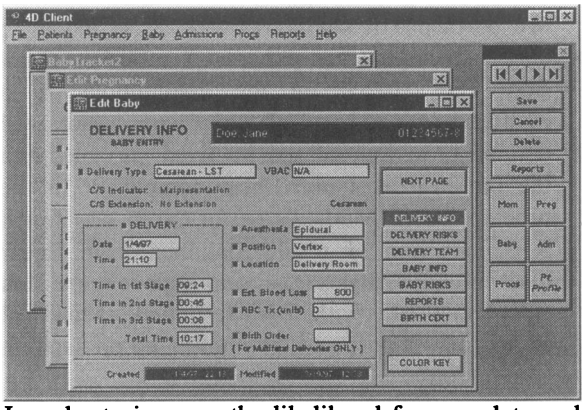
An Obstetrical service is an ideal model of a structured clinical data set. Typically, patients undergo a similar course of routine prenatal care spanning six to nine months that leads to a common outcome (i.e. vaginal delivery). At various clinical milestones toward the end of the pregnancy and shortly thereafter, a series of standard documents must be generated in order to complete an obstetrical medical record. These would include a delivery note, discharge summary and birth certificate. One of the most challenging tasks for an obstetrical service is the timely completion and submission of birth certificates. Significant human resources have been required on our obstetrical service in order to complete birth certificates in accordance with state guidelines. In addition, completion of obstetrical inpatient records with a signed delivery note and discharge summary is necessary in order to generate an inpatient bill. Billing delays contribute to reduced revenue. In order to address these issues, we have developed an enterprise wide client/server relational database management system called BabyTracker that contains the majority of the functionality of an electronic obstetrical record.

METHODS

Development of BabyTracker began with an assessment of the data elements that would be needed in order to fully complete the obstetrical. A relational database model was developed to incorporate these elements. A total of 259 fields were divided across 19 related tables.

The database relational structure contains 19 tables. The core data is stored in four tables: [Mother], [Pregnancies], [Babies], and [Admissions]. BabyTracker was developed using the 4th Dimension (4D) environment (ACIUS, Inc., Cupertino, CA). 4D is a relational client/server database management engine that supports Windows 3.1, Windows 95, Windows NT and Macintosh.

We have developed a distributed data entry model for BabyTracker. Different individuals within our organization are responsible for entering various specific data elements to the various BabyTracker records. An example screen is shown below.



In order to increase the likelihood for complete and accurate data entry, we have developed interactive data validation routines and a User Error Log file. This file serves as an audit trail of user activity by flagging a variety of suspect operations

RESULTS and CONCLUSIONS

Since BabyTracker went live in 1995, there have been 6,303 pregnancies tracked in 6,026 women that have delivered 4,258 babies. This has resulted in considerable savings in terms of personnel and more timely completion of medical records. In addition, the timely submission of birth certificates to the State of Pennsylvania has resulted in fewer non-compliance incidents. The physicians are no longer required to dictate delivery and discharge summaries and these summaries are no longer transcribed. The transcription savings are estimated at .75 FTE. The implementation of BabyTracker's generation of birth certificates saved one additional clerical FTE. The automatic generation of the reports needed for the quality improvement team has been estimated to save .15 FTE. Our estimated clerical FTE savings are $72,000 per year. Therefore, since BabyTracker went live two years ago, we have saved over $140,000.

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